Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of detail enhancement for ~~an original~~ a digital image signal represented by a set of pixels, comprising the steps of:

(a) detecting a slanted edge in the image signal, detecting image pixels that belong to a luminance transition range of ~~an image~~ the slanted edge and determining a center pixel and a length of the luminance transition range, wherein the length of the luminance transition range is along a direction within 45° from the edge direction ;

(b) generating gain suppression factors for the detected image pixels in the luminance transition range of the image edge; and

(c) performing image detail enhancement on the set of image pixels while selectively reducing enhancement of the detected image pixels in the luminance transition range relative to enhancement of other image pixels based on the gain suppression factors.

2. (Currently amended) The method of claim 1, further comprising the steps of:

selecting enhancement gain factors for the set of image pixels; and

combining the gain suppression factors with the corresponding enhancement gain factors to obtain adjusted gain factors;

wherein the length of the luminance transition range is along a row direction or a column direction, and

wherein the steps of performing image detail enhancement further includes the steps of performing image detail enhancement on the set of image pixels based on the adjusted gain factors to selectively reduce enhancement of the detected image pixels in the luminance transition range of the slanted edge.

3. (Canceled).

4. (Currently amended) The method of claim [[3]] 2, wherein the step of generating a gain suppression factor for a detected pixel further includes the steps of:

for each pixel within the detected luminance transition range, generating a gain suppression factor based on: (i) the position of the pixel within the luminance transition range relative to the center pixel of the luminance transition range, (ii) the enhancement gain factor for ~~that~~ the pixel, and (iii) ~~the~~ a luminance contrast across the edge.

5. (Currently amended) The method of claim [[3]] 2, wherein:

the step of generating the gain suppression factors further includes the steps of selecting the gain suppression factors such that detail enhancement at the center pixel location in the luminance transition range is suppressed more than neighboring

pixels in the luminance transition range, wherein for pixel locations farther away from the center pixel location detail enhancement suppression is further reduced.

6. (Currently amended) The method of claim 5, wherein the gain suppression factors are selected ~~to essentially eliminate~~ such that detail enhancement suppression for pixels outside the detected luminance transition range is essentially eliminated.

7. (Currently amended) The method of claim [[3]]2, wherein the step of generating the gain suppression factors further includes the steps of:

selecting a candidate gain suppression factor α_c for each pixel location within the detected luminance transition range as:

$$\alpha_c = |i| * (1-s) * 2/(N+1) + s$$

where:

N is the length of the luminance transition range,

i is the index for the location of a pixel p_i in the luminance transition range, $-\frac{N-1}{2} \le i \le \frac{N-1}{2}$, such that the index of the current pixel location is 0, and

s is a variable related to both the local luminance contrast and the pixel's enhancement gain factor, $0 \le s \le 1$.

8. (Currently amended) The method of claim 7, wherein:

$$s = 1 - \max(0,\ \min(1,\ (d - T_1)/(T_2 - T_1)))$$

where:

T_1 and T_2 are predetermined threshold values, $T_2 > T_1 \geq 0$, and

d is the luminance contrast within the detected luminance transition range, <u>defined</u> as:

$$d = | p_{-\frac{N-1}{2}} - p_{\frac{N-1}{2}} |.$$

9. (Currently amended) The method of claim 8, wherein the threshold values T_1 and T_2 are related to an enhancement gain factor, K , as:

$$T_1 = C_1 / K \qquad ,$$

$$T_2 = C_2 / K \qquad ,$$

where C_1 and C_2 are constants.

10. (Currently amended) The method of claim 7, wherein the step[[s]] of generating the gain suppression factor for a detected pixel further includes the steps of:

selecting an initial gain suppression factor α ;<u> and</u>

upon generating each candidate suppression factor α_c for the pixel location, updating α as:

$$\alpha = \min(\alpha, \alpha_c).$$

11. (Currently amended) The method of claim [[2]] 3, wherein the digital image signal is represented by f, and wherein the step of performing detail enhancement for the ~~original~~ digital image signal f at a detected pixel further includes the steps of:

performing a low pass filter function on the image signal f to generate an unsharp image signal f_1;

determining ~~the~~ a difference signal between the ~~original~~ digital image signal f and the unsharp signal f_1~~, as a different signal~~, wherein said difference signal represents image details;

selectively boosting the difference signal such that enhancement of the difference signal at the detected pixel locations is reduced relative to enhancement of other image pixels based on the gain suppression factors; and

adding the boosted signal to the original digital signal to obtain a detail enhanced image signal g.

12. (Currently amended) The method of claim 11, wherein the enhanced image signal g is related to the ~~original~~ digital image signal f as:

$$g = (f - f_1) * K * \alpha + f,$$

wherein:

$(f - f_1)$ is the difference signal,

K is the enhancement gain factor for the detected pixel, and

α is the gain suppression factor for the detected pixel.

13. (Canceled).

14. (Currently amended) The method of claim 1, wherein:

the steps ~~of detecting image pixels that belong to an image edge~~ (a) further include[[s]] the steps of:

defining a two-dimensional window of pixels in the digital image;

determining a mean value for a plurality of pixels around a selected pixel inside said window;

based on the mean value, determining [[if]] whether the selected pixel is in an edge region in the window,~~;~~

~~if the selected pixel is in an edge region, then determining if the selected pixel is essentially a center pixel in a luminance transition range of a slant edge;~~

~~if the selected pixel is essentially a center pixel in a luminance transition range of a slant edge, then determining the length of the luminance transition range of the slant edge; and~~

wherein the step of generating gain suppression factors further includes, for each pixel within the luminance transition range, generating a gain suppression factor based on the position of the pixel within the luminance transition range relative to the center pixel of the luminance transition range;

and wherein the step of performing image detail enhancement on the image pixels includes selectively adjusting enhancement of the detected image pixels relative to enhancement of other image pixels based on the gain suppression factors, such that the

length of the luminance transition range is essentially maintained.

15. (Currently amended) A detail enhancement system for enhancing an ~~original~~ digital image signal represented by a set of pixels, comprising:

(a) a detector that detects a slanted image edge and image pixels that belong to a luminance transition range of [[an]] the slanted image edge, wherein the luminance transition range is along a direction within 45° from the edge direction;

(b) a generator that generates gain suppression factors for the detected pixels; and

(c) a detail enhancer that performs image detail enhancement on the image pixels while selectively reducing enhancement of the detected image pixels relative to enhancement of other image pixels based on the gain suppression factors.

16. (Currently amended) The system of claim 15, wherein the luminance transition range is along a row direction or a column direction, and wherein the detail enhancer combines the gain suppression factors with selected enhancement gain factor to obtain adjusted gain factors, and performs image detail enhancement on the set of image pixels based on the adjusted gain factors to selectively reduce enhancement of the detected image pixels.

17. (Currently amended) The system of claim 16, wherein the detector further detects ~~a luminance transition range of the edge and~~ a center pixel of the luminance transition range.

18. (Currently amended) The system of claim 17, wherein the generator further generates a gain suppression factor for a pixel within the detected luminance transition range based on: (i) the position of the pixel within the luminance transition range relative to the center pixel of the luminance transition range, (ii) the enhancement gain factor for ~~that~~ the pixel, and (iii) ~~the~~ a luminance contrast across the slanted edge.

19. (Currently amended) The system of claim 17, wherein the generator further selects the gain suppression factors such that detail enhancement at the center pixel location in the luminance transition range is suppressed more than neighboring pixels in the luminance transition range, wherein for pixel locations farther away from the center pixel location, detail enhancement suppression is further reduced.

20. (Currently amended) The system of claim 19, wherein the gain suppression factors are selected ~~to essentially eliminate~~ such that detail enhancement suppression for pixels outside the detected luminance transition range is essentially eliminated.

21. (Currently amended) The system of claim 17, wherein the generator <u>further</u> generates the gain suppression factors by selecting a candidate gain suppression factor α_c for each pixel location within the detected luminance transition range as:

$$\alpha_c = |i| * (1-s) * 2/(N+1) + s$$

where:

N is the length of the luminance transition range,

i is the index for the location of a pixel p_i in the luminance transition range, $-\frac{N-1}{2} \le i \le \frac{N-1}{2}$, such that the index of the current pixel location is 0, and

s is a variable related to both the local luminance contrast and the pixel's enhancement gain factor, <u>and</u> $0 \le s \le 1$.

22. (Currently amended) The system of claim 21, wherein:

$$s = 1 - \max(0,\ \min(1,\ (d - T_1)/(T_2 - T_1)))$$

where:

T_1 and T_2 are predetermined threshold values, $T_2 > T_1 \ge 0$, and

d is the luminance contrast within the detected luminance transition range, <u>defined</u> as:

$$d = |p_{-\frac{N-1}{2}} - p_{\frac{N-1}{2}}|.$$

23. (Currently amended) The system of claim 22, wherein the threshold values T_1 and T_2 are related to an enhancement gain factor, K , as:

$$T_1 = C_1 / K \quad ,$$

$$T_2 = C_2 / K \quad ,$$

where C_1 and C_2 are constants.

24. (Currently amended) The system of claim 21, wherein the generator further generates the gain suppression factor for a detected pixel by selecting an initial gain suppression factor α , and upon generating each candidate suppression factor α_c for the pixel location, updating α as $\alpha = \min(\alpha, \alpha_c)$.

25. (Currently amended) The system of claim 16, wherein the detail enhancer further performs detail enhancement for the ~~original~~ digital image signal at a detected pixel, the detail enhancer comprising:

a filter that performs a low pass filter function on the image signal to generate an unsharp image signal f_1;

a difference node that determines the difference between the ~~original~~ digital image signal and the unsharp signal f_1, as a difference signal, wherein said difference represents image details;

a combiner that selectively boosts the difference signal based on the gain suppression factors such that enhancement of the difference signal at the detected pixel locations is reduced relative to enhancement of other image pixels; and

a summing node that combines the boosted signal to the ~~original~~ digital image signal to obtain a detail enhanced image signal g.

26. (Currently amended) The system of claim 25, wherein the enhanced image signal g is related to the ~~original~~ digital image signal as:

$$g = (f - f_1) * K * \alpha + f$$

wherein:

f is the ~~original~~ digital image signal,

$(f - f_1)$ is the difference signal,

K is the enhancement gain factor for the pixel, and

α is the gain suppression factor for the pixel.

27. (Currently amended) The system of claim 15, wherein to detect image pixels that belong to an image edge, the detector further defines a two-dimensional window of pixels in the digital image, and determines a mean value for a plurality of pixels around a selected pixel inside said window, based on the mean value, determines [[if]] whether the selected pixel is in a an edge region in the window, and if the selected pixel is in an edge region, then the detector determines [[if]] whether the selected pixel is essentially a center pixel in a luminance transition range of a slant edge, and if the selected pixel is

essentially a center pixel in a luminance transition range of a slant edge, then the detector determines the length of the luminance transition range of the slant edge.

28. (Currently amended) The system of claim 27, wherein:

the generator is <u>further</u> configured to generate <u>a</u> gain suppression factor for each pixel within the luminance transition range based on the position of the pixel within the luminance transition range relative to the center pixel of the luminance transition range; and

the detail enhancer is further configured to perform image detail enhancement on the image pixels by selectively adjusting enhancement of the detected image pixels relative to enhancement of other image pixels based on the gain suppression factors, such that the length of the luminance transition range is essentially maintained.